LEAN into Pharmacy Process Improvement

Six Sigma/LEAN Tools for Everyday Use

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The speakers have no conflicts of interest to disclose

Objectives

1. Distinguish between Lean and Six Sigma
2. Describe the Define, Measure, Analyze, Improve, and Control (DMAIC) process
3. Discuss the Lean and Six Sigma tools to pharmacy related projects

Lean – Pursuing a Perfect Process

Kristi Stice, PharmD, BCPS
Green Belt Certified in Lean Six Sigma
Director of Pharmacy

Lean thinking is the continual and relentless pursuit of eliminating waste in our system and processes.

One must understand how waste is defined.
One must learn how to recognize waste.

What Does LEAN Mean?

Lean Waste Acronym = DOWNTIME

DOWNTIME = Waste

Errors, duplicate work, checking, inspection, incomplete/inaccurate information.

Defects

Defects

Monitoring

Waste not being consulted for improvement ideas. Not getting the most out of the individual.

Non-utilized Talent

Transportation

Waste materials or people.

Inventory

Work waiting, patients waiting, batching (wasting to be worked).

Motion

Excessive Processing

Efficient workstation design or unnecessary human movement.

Efficient processes that use more steps than are actually required for the desired outcome.

Waste

• Synonymous with non-value-added.
• Anything that does not add value to the final product or service for the customer or patient.
• An activity the customer would not want to pay for if they knew it was happening.
• Any activity that takes time, resources, or space, but does not add value to a product or service.
• Lean Waste Acronym = DOWNTIME
How Do You Find Waste?

You can not find what you are not looking for!
You have to establish, measure, and compare metrics to determine baseline and gap.

You need to see it with your own eyes!
Go to the workplace with open-mind and open-eyes to see the processes for yourself.

You can not do it all alone!
Engage your employees through learning, empowerment, and support to identify and improve.

You have to commit!
Reducing waste is like accumulating interest, a little over a long time, but you have to start.

Three Key Lean Concepts

Value
Waste
Flow

Lean Process

- Specify Value: Define value from the customers perspective and express value in terms of a specific product or service.
- Map the Value Stream: Map all of the steps, value-added and non-value-added, that bring a product or service to the customer.
- Establish Flow: The continuous movement of products, services and information from end to end through the process.
- Implement Pull: Nothing is done by the upstream process until the downstream customer signals the need.
- Work to Perfection: The complete elimination of waste so all activities create value for the customer.

Which of the following is NOT one of the three lean concepts?
A. Flow
B. Value
C. Defects
D. Waste

Six Sigma – A Prescription for Change

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Green Belt Certified in Lean Six Sigma
Medication Safety Officer
What Does Six Sigma Mean?

• The term “Sigma” is a measurement of how far a process deviates from perfection – a measure of the number of “defects”

• A quality improvement methodology that applies statistics to measure and reduce variation in processes

Six Sigma Goals

• Improve business performance and customer satisfaction using data
• Customer and financially focused
• Reduce non-value added steps
• Eliminate waste and variation
• Helps prevent jumping to conclusions and having to further optimize a process

What is Six Sigma?

People  Process  Technology

Improved Outcomes

Variation

Example: ED throughput, turn around time

The Sand in the Machine

What Does Six Sigma Mean?

<table>
<thead>
<tr>
<th>Sigma Level</th>
<th>Defects Per Million Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>308,537</td>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
<td>6,210</td>
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<tr>
<td>5</td>
<td>233</td>
</tr>
<tr>
<td>6</td>
<td>3.4</td>
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</tbody>
</table>
So ... what's a “sigma” and why do I need six of them?

What is “Six Sigma”?

99.99966% of values are within specifications

Lean Six Sigma

Measure | 3 Sigma (93.3193% Accurate) | 4 Sigma (99.379% Accurate) | 5 Sigma (99.9767% Accurate) | 6 Sigma (99.99966% Accurate)
---|---|---|---|---
Wrong prescriptions filled annually | 1,336,000 | 124,200 | 4,660 | 68
Incorrect surgical operation weekly | 33,400 | 3,100 | 117 | 1.7

Six Sigma as a Quality Goal

• The higher the sigma, the fewer the defects
• An increase from 3 to 6 Sigma represents a 20,000 fold improvement in quality

Medical Errors - Third Leading Cause of Death

• How many avoidable deaths occur annually in U.S. hospitals?
  • 250,000
  One 737 plane crashes every 5.5 hr

The purpose of Six Sigma is to reduce variation in a process

A. True
B. False
Lean and Six Sigma

Lean and Six Sigma are focused on continuous improvement of the system.

**Lean**
- Eliminate waste
- Achieve flow and pull

**Six Sigma**
- Eliminate defects
- Reduce variation in processes

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Applications of Lean and Six Sigma

Which to use – Six Sigma vs. Lean?

- Lean = Getting a process under control / removing waste
- Six Sigma = Decreasing the variation / defects in the process
- THEY ACTUALLY WORK TOGETHER!

Boiling Frog

- The boiling frog story is a widespread anecdote describing a frog slowly being boiled alive. The premise is that if a frog is placed in boiling water, it will jump out, but if it is placed in cold water that is slowly heated, it will not perceive the danger and will be cooked to death.

Sacred Cows

- Something that is regarded by some people with such respect and veneration that they do not like it being criticized by anyone in any way.

- The figurative use of the term 'sacred cow', to refer to a project or process that is immune from tampering, is American in origin and also dates from the late 19th century.
Frogs and Cows

Is there a Boiling Frog in your Department?

Is there a Sacred Cow in your Department?

Applying Lean

A-3 mapping: A Lean Tool to Minimize Waste

What is A3 mapping?

• A-3 is PAPER SIZE (11 X 17)
• It is standard work for problem solving
• Provides a standard structure to be able to ask good questions
• Allows everyone to talk about a problem in a focused way
• Leads to effective problem solving based on facts
• Encourages front-line engagement

A3 Map Structure – uses PDCA

Problem Statement/Background

Problem statement:
• A good / concise description of what the report is about

Background:
• What are you talking about and why
• What is the strategic, operational, historical or organizational context of the situation?

Putting the A3 map to work at DMH

Our Story
Problem Statement/Background

**Problem statement:**
• OB is missing medication charges

**Background:**
• In OB, medications are charged upon scan/MAR administration
• Anesthesia is giving administering these medications
• They remove them pre-procedure from OB’s Omnicell
• In OR, medications are charged on dispense from Omnicell
• Historically, the head of anesthesia has refused to make his staff scan

Current Condition

**Current Condition:**
• Where do we stand NOW?
• Diagram how the work happens (VSM or process flow)
• Identify the waste, defects and problems in storm clouds.
• May also want to use charts or graphs.

Current Condition

Current Condition: Diagram how the work happens and identify the waste, defects and problems.

Goal/Target:

**Goal/Target:**
• What specific outcome or improvement in performance do you need to achieve?
• Show how much by when
• Charges for medications are captured 99% of the time by end of month

Problem Analysis

**Problem Analysis:**
• Why does the problem exist?
• For each problem/unwanted variation determine the root cause
• Ask the 5 why’s

Problem Analysis

**Problem Analysis:**
• Why is the charge lost?
  • The medication isn’t charted on the MAR (OB is charge on administration)
  • Why isn’t the medication charted on the MAR?
  • OB nurses will not chart/scan a medication they are not giving
  • Anesthesia doesn’t scan
• Why doesn’t anesthesia scan?
  • They chart on paper
• Why do they chart on paper?
  • That’s a whole new A3 map!
Target Condition/Future State

• Create a graphic of the proposed better way to do the work to achieve the goal.

Countermeasures/Action Plan

**Countermeasures:**
• What needs to happen to move from Current State to Future State?
• Create one or more countermeasures that state WHAT will need to change.
• The counter measures must address root causes identified in the analysis

**Action Plan:**
• How will you implement. 3 W’s
• Focus on the HOW to get to the what listed in the counter measure(s).
• What actions will be taken and in what sequence to achieve the counter measures?
• Who will be responsible for what by when

Countermeasures/Action Plan

**Countermeasures: What**
• Re-configure anesthesia epidural tray
• Remove anesthesia meds from OB Omnicell
• Educate involved staff on new process

**Action Plan: How**
• Pam and Sue go through checklist of meds and tray arrangement
• Mark remove fentanyl and bupivacaine from OB Omnicell
• Sue G send an e-mail to anesthesia staff and post notice on communication board

Metrics/Follow-up

**Metrics**
• Cost / Benefit:
• Implementation costs
• What was the old cost? What is the new cost? Can a savings be calculated?
• TEST: How will you measure the effectiveness of the action plan?
• Results: What are the results?

**Follow Up:**
• How will you know that the actions have the desired impact?
• How will you know you know targets are being met?
• How will you share your learning and success with others?

A3 Mapping: Driving it home

• A3 map is simply a tool
• Helps you focus on the process & root cause vs. just trying to “fix it”
• Gets people talking about the real cause of the problem
• Can be used by any level staff member
• You MUST go to the Gemba (where the work takes place)
• Use pencil – it’s always a work in progress!

Which of the following statements about A3 maps is NOT true?

A. They help you to determine the root cause of the issue
B. They should be completed by one person to avoid bias
C. They follow PDCA (Plan, Do, Check, Act) methodology
D. They show you the current flow and future flow options all in one document
Applying Six Sigma

Hospital Initiatives

DMAIC Drives Six Sigma Process

Six Sigma Project Ideas

Why Zero Defects is the Only Acceptable Quality Standard

What is the defect per million opportunities if we have an error rate of 5% for a process:

- A. 10,000
- B. 5,000
- C. 50,000
- D. 10,000
Questions to Consider for Your Site

• How can stable processes improve service for our patients and customers?
• Do you think we have waste and inefficiencies? Where?
• Do you think there is opportunity to improve patient satisfaction?
• What kind of processes do we have that are costly to hospital?

Medication Reconciliation 
Lean Six Sigma Project 
Mount Sinai Hospital

Define

**Problem Statement:**
Data from a random selection of patients at Mount Sinai Hospital from January 1, 2015 - April 20, 2015 reveals that 12.4% (48/387) of medication discrepancies were identified by pharmacists, resulting in reduced readmissions and patient harm.

**Goal Statement:**
Increase the proportion of medication discrepancies identified and corrected by more than 50% during the inpatient visit from 12.4% to 25% by July 2016 on the general medicine unit, 6 North.

Analyze

**Improve**

• The medication reconciliation policy was updated to define roles and responsibilities and expectations.
• Competencies were uploaded for physicians, nurses and pharmacists.
• Medications are now organized by therapeutic class instead of alphabetical order. This allows the physician to identify duplications in therapy on admission.
Only 12.4% of medication discrepancies were identified and corrected during the baseline period. Currently, 47.1% of medication discrepancies are identified and corrected, which is above the target of 25%. There were no medication duplication discrepancies after the Improve stage of the DMAIC process.

Cost of Poor Quality (COPQ)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Results</th>
<th>Goal</th>
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<tr>
<td>COPQ</td>
<td>$138,915</td>
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COPQ: PN would have an annualized cost avoidance of $138,915 if pharmacy completed medication histories on all patients. Cost of one lawsuit in recent years due to ADE’s related to medication reconciliation discrepancies have resulted in approximately $65,000 in legal fees only.

Conclusion

Six Sigma is a:
- Quality improvement methodology that applies statistics to measure and reduce variation in processes
- Reduce defects
- Stabilize processes
- Patient satisfaction
- Improve efficiency
- Eliminate waste
- Reduce cost of poor quality
In the DMAIC process, one can go to the Analyze phase before completing the Measure phase.

A. True
B. False

Lean into Pharmacy Process Improvement -

Lean tools/Six Sigma for everyday use

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